



Addressing diarrhea prevalence in the West African Middle Belt: Social and geographic dimensions in a case study for Benin

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Abstract:

BACKGROUND: In West Africa, the Northern Sahelian zone and the coastal areas are densely populated but the Middle Belt in between is in general sparsely settled. Predictions of climate change foresee more frequent drought in the north and more frequent flooding in the coastal areas, while conditions in the Middle Belt will remain moderate. Consequently, the Middle Belt might become a major area for immigration but there may be constraining factors as well, particularly with respect to water availability. As a case study, the paper looks into the capacity of the Middle Belt zone of Benin, known as the Oueme River Basin (ORB), to reduce diarrhea prevalence. In Benin it links to the Millennium Development Goals on child mortality and environmental sustainability that are currently farthest from realization. However, diarrhea prevalence is only in part due to lack of availability of drinking water from a safe source. Social factors such as hygienic practices and poor sanitation are also at play. Furthermore, we consider these factors to possess the properties of a local public good that suffers from under provision and requires collective action, as individual actions to prevent illness are bound to fail as long as others free ride. **METHODS:** Combining data from the Demographic Health Survey with various spatial data sets for Benin, we apply mixed effect logit regression to arrive at a spatially explicit assessment of geographical and social determinants of diarrhea prevalence. Starting from an analysis of these factors separately at national level, we identify relevant proxies at household level, estimate a function with geo-referenced independent variables and apply it to evaluate the costs and impacts of improving access to good water in the basin. **RESULTS:** First, the study confirms the well established stylized fact on the causes of diarrhea that a household with access to clean water and with good hygienic practices will, irrespective of other conditions, not suffer diarrhea very often. Second, our endogeneity tests show that joint estimation performs better than an instrumental variable regression. Third, our model is stable with respect to its functional form, as competing specifications could not achieve better performance in overall likelihood or significance of parameters. Fourth, it finds that the richer and better educated segments of the population suffer much less from the disease and apparently can secure safe water for their households, irrespective of where they live. Fifth, regarding geographical causes, it indicates that diarrhea prevalence varies with groundwater availability and quality across Benin. Finally, our assessment of costs and benefits reveals that improving physical access to safe water is not expensive but can only marginally improve the overall health situation of the basin, unless the necessary complementary measures are taken in the social sphere. **CONCLUSION:** The ORB provides adequate water resources to accommodate future settlers but it lacks appropriate infrastructure to deliver safe water to households. Moreover, hygienic practices are often deficient. Therefore, a multifaceted approach is needed that acknowledges the public good aspects of health situation and consequently combines collective action with investments into water sources with improved management of public wells and further educational efforts to change hygienic practices.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2377241>

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Policymaker

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality, Food/Water Security, Human Conflict/Displacement

Food/Water Quality: Pathogen

Geographic Feature:

resource focuses on specific type of geography

Freshwater

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Benin

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Other Diarrheal Disease

Intervention:

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation:



mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: 

populations at particular risk or vulnerability to climate change impacts

Children, Low Socioeconomic Status

Resource Type: 

format or standard characteristic of resource

Research Article

Timescale: 

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: 

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content